

WHAT IS CLAIMED IS:

1. A semiconductor device, comprising:
 - a semiconductor substrate;
 - a low dielectric constant film constituted essentially of a ladder-type hydrogen siloxane provided on said semiconductor substrate;
 - a protection film provided on said low dielectric constant film; and
 - a metal interconnect formed in said low dielectric constant film and said protection film.
2. The semiconductor device as recited in Claim 1,
 - wherein said protection film is constituted of a material having greater polishing resistance against a chemical mechanical polishing process than said low dielectric constant film.
3. The semiconductor device as recited in Claim 1,
 - wherein said protection film is constituted essentially of a silicon oxide film.
4. The semiconductor device as recited in Claim 1,
 - wherein said ladder-type hydrogen siloxane has a refractive index not less than 1.38 but not greater than 1.40 at a wavelength of 633 nm.
5. The semiconductor device as recited in Claim 1,
 - wherein said ladder-type hydrogen siloxane has a density not less than 1.50g/cm^3 but not greater than 1.58g/cm^3 .
6. The semiconductor device as recited in Claim 1,
 - wherein a plurality of said metal interconnects is

provided so as to form an isolated region where one of said plurality of metal interconnects is separately located and
5 a concentrated region where the other metal interconnects are closely disposed to one another.

7. The semiconductor device as recited in Claim 6,

wherein said plurality of metal interconnects in the concentrated region is disposed such that an interval between substantially parallel portions of neighboring metal
5 interconnects is not greater than a double of a width of the respective metal interconnects.

8. The semiconductor device as recited in Claim 1,

wherein said protection film is formed such that a film thickness thereof at its thickest portion is in a range of 10% to 30% of a film thickness of said low dielectric constant
5 film at its thickest portion.

9. A method of manufacturing a semiconductor device comprising:

forming a low dielectric constant film constituted essentially of a ladder-type hydrogen siloxane on a
5 semiconductor substrate;

forming a protection film on said low dielectric constant film;

forming a metal interconnect in said low dielectric constant film and said protection film; and

10 polishing said metal interconnect with said protection film provided on said low dielectric constant film.

10. The method as recited in Claim 9, further comprising:

forming an interlayer insulating film on said protection film after polishing said metal interconnect; polishing and planarizing said interlayer insulating
5 film; and
repeating the respective steps to thereby form a multilayer interconnect structure.